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ETHYLIC BIODIESEL PRODUCTION FROM CASTOR AND BITTER ALMOND OILS FEEDSTOCK MIXTURE

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Selection of low price and non-edible feedstocks for biodiesel production is a very important target to reduce the production cost of biodiesel. Accordingly, biodiesel was produced from a mixture of two non-edible oils in particular; castor oil (CO) and bitter almond oil (BAO). Various blends of the CO : BAO (10:90 -50:50 % w/w) were prepared and evaluated in order to choose the optimal blend properties similar to those reported for conventional raw oils for biodiesel production. The results indicate that the equivalent blend (50:50 % w/w) possessed the optimal properties. Therefore, it was chosen as a raw feedstock for producing biodiesel through base-catalyzed transesterification process with ethanol. Experimental parameters affecting transesterification process, such as the type and the concentration of the alkali catalyst, ethanol to mixed oils molar ratio, the reaction temperature, and

the reaction time were optimized. Biodiesel with maximum yield (98.88 wt.% with a purity of 97.66 % w/w) was obtained by implementing 0.50 % KOH w/w of oil, 5:1 ethanol to oil molar ratio, 30 °C reaction temperature, and 30 minutes of reaction. The ¹HNMR spectroscopy confirmed the conversion of the blend to ethylic biodiesel. Properties of the resulting biodiesel were within the acceptable limits prescribed by ASTM D 6751. Furthermore, the obtained ethylic biodiesel had density and kinematic viscosity values much lower than those of ethylic biodiesel produced from CO individually. It was concluded that using the blend could be an easy means to improve properties of biodiesel from castor oil and to reduce the production cost of biodiesel as well.

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